UCLouvain

lmapr2647

2019

Sustainable treatment of industrial and domestic waste: Fundamentals

In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

5 credits	30.0 h + 15.0 h	Q1

Teacher(s)	Françoisse Olivier ;Luis Alconero Patricia ;Noiset Olivier ;Stenuit Benoît ;
Language :	English
Place of the course	Louvain-la-Neuve
Prerequisites	*The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Main themes	• Sustainability in the industry • Treatment methods and technology for gaseous effluents • Treatment methods and technology for liquid effluents (waste water) • Treatment methods and technology of solid waste
Aims	Given the AA of the program of "Master ingénieur civil en chimie et science des matériaux", this course contributes to the development, acquisition and evaluation of the following learning outcomes: • AA1.1, • AA2.1, AA2.2, AA2.3, AA2.4, AA2.8 More concretely, at the end of the course, the student will be able to : 1 • understand and to explain the origin, the nature, the amounts and volumes of waste; • acquire a global view on basic concepts on the treatment and on the valorisation of residues; • propose and discuss suitable techniques to characterise critically the flows of effluents; • establish a strategy of treatment in the framework of environmental standards and of sustainable development; • integrate all the processes in a plant with a view toward their optimisation. - - - - *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The students will be evaluated by means of a written exam. The exam involves reflection questions on the topics given during the course; the student will have to be able to evaluate a process and design the most appropriate treatment methods according to the knowledge acquired during the course. The exam is the 100% of the final mark.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Classroom lessons on fundamentals of sustainability and the main treatment technology that is applied for gas, liquid and solid streams.
Content	This course is a basis course for a wide public of engineering and science students. Its main aim is to initiate the students to the methods of treatment of industrial and domestic effluents, either gaseous, liquid or solids. It shall also place the problem of waste, residue and effluent treatment in the scope of sustainable development. The student will acquire knowledge on the main treatment methods that are used to process/recover/reuse streams in a gas, liquid or solid waste. The following topics will be discussed: Cours 1. Introduction to sustainability in the industry (2 hours) Cours 2.1a. Pollutants gas high T : Dust collectors (2 hours) Cours 2.1b. Pollutants gas high T : Acid gas removal (2 hours) Cours 2.1c. Pollutants gas high T : Acid gas removal (cont.) and micropollutants removal (2 hours) Cours 2.1d. Pollutants gas high T : NOx removal and CO_2 capture & storage (2 hours) Cours 2.2a. VOCs and Odours low T : Solvents and other VOCs (2 hours) Cours 2.2b. VOCs and Odours low T : Odours (2 hours) Cours 2.2c. Treatment techniques (2 hours) Cours 3.1. Composition of wastewater (2 hours)

	Cours 3.2. Primary wastewater treatment: Physic-chemical treatment (2 hours) Cours 3.3a. Secondary wastewater treatment: Biological treatment I (2 hours) Cours 3.3b. Secondary wastewater treatment: Biological treatment II (2 hours) Cours 3.4a. Tertiary wastewater treatment: General technologies (2 hours) Cours 3.4b. Tertiary wastewater treatment: Membrane technology (2 hours) Cours 4.1. Solid waste treatment : Incineration (2 hours) Cours 4.2. Solid waste treatment: Polymers (2 hours) Cours 4.3. Specific waste (2 hours)
Inline resources	Site Moodle du cours *:* https://moodleucl.uclouvain.be/course/view.php?id=8143
Bibliography	Des notes de cours, diapositives
Other infos	All the course material will be available in the Moodle platform.
Faculty or entity in charge	FYKI

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Interdisciplinary Advanced Master in Science and Management of the Environment and Sustainable Development	ENVI2MC	5		
Master [120] in Chemistry and Bioindustries	BIRC2M	5		
Master [120] in Environmental Science and Management	ENVI2M	5		
Master [120] in Environmental Bioengineering	BIRE2M	5	LBIRC2109 AND LBRTE2101 AND LBRTE2201	
Master [120] in Chemical and Materials Engineering	KIMA2M	5		